Patent Claims

1. Appliance for determining the impedance Z_{aw} of the respiratory tract by measuring the alternating pressure (dp) in the region of the mouth of a patient after producing an oscillating air pressure signal, which comprises
   - a mouthpiece (7),
   - an electroacoustic transducer (1) provided with a mechanical oscillation system (2) for generating the oscillating air pressure signal,
   - a tube (6) for connecting the electroacoustic transducer (1) to the mouthpiece (7),
   - a reference resistance (4) for determining the reference impedance Z_{ref}, and
   - a computing device (5) for calculating the impedance Z_{aw} of the respiratory tract on the basis of the reference impedance Z_{ref} of the reference resistance (4) the total impedance Z_{ges}, and the total phase angle Φ,

   characterised in that the change in the deflections of the mechanical oscillation system (2) on the electroacoustic transducer (1), caused by the alternating pressure (dp) of the breathing of the patient, can be measured in a contactless manner by means of a measuring device 3b.

2. Appliance according to claim 1, characterised in that the electroacoustic transducer (1) is a loudspeaker (3a), whose mechanical oscillation system also forms the oscillation system of a microphone (3b), and the measurement of the changed deflection of the mechanical oscillation system (2) takes place during the generation of the oscillating air-pressure signal.

3. Apparatus according to one of claims 1 and 2, **characterised in that** the mechanical oscillation system (2) is a movable, stiff diaphragm, consisting of a moisture-resistant material or sheet metal.

4. Appliance according to one of the preceding claims, **characterised in that** an electrodynamic or an electromagnetic or piezoelectric or piezoresistive transducer (1) is used as electroacoustic transducer (1).

5. Appliance according to claims 1 and 2 **characterised in that** the deflection of the diaphragm (2) is measured
   - inductively,
   - capacitatively,
   - piezoelectrically or
   - optically.

6. Appliance according to claim 5, **characterised in that** the electrically conductive diaphragm or the diaphragm (2) acted on by electrically conductive elements, together with a positionally fixed electrode (3b) forms a capacitor for capacitative measurement of the diaphragm deflection.

7. Appliance according to claim 5, **characterised in that**, for the inductive measurement of the diaphragm deflection, an induction-generating metallic conductor is applied to the diaphragm (2) at one or more points and a positionally fixed induction coil (3b) is installed in the region of the metallic conductor.

8. Appliance according to claim 5, characterised in that, for the optical measurement of the diaphragm deflection, a reflector or detector is applied to the diaphragm (2) at one or more points onto which a laser beam (36) is directed.

9. Appliance according to one of the preceding claims, **characterised in that** the reference resistance (4) is an air tube (4), which is open at one end and the other end is connected to the mouthpiece (7), has a calibrated, predeterminable reference impedance Z_{ref} and is removable.

10. Appliance according to one of the preceding claims, characterised in that the air tube forming the reference resistance (4) is cylindrical or conically flared at the end facing away from the mouthpiece (7), and is connected to a sieve resistance.

11. Appliance according to one of the preceding claims, characterised in that, as mouthpiece (7), a breathing mask is used, which encloses the patient's mouth and/or nose openings in an airtight manner and is connected to the tube (6) by means of an airtight plug connection.

12. Appliance according to one of the preceding claims, characterised in that a monitor and/or an output unit in the form of a printer are assigned to the computing device (5).